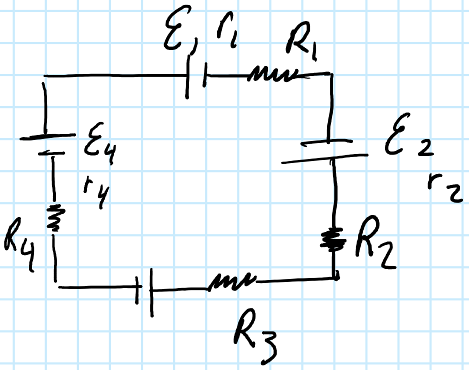
27_Clase

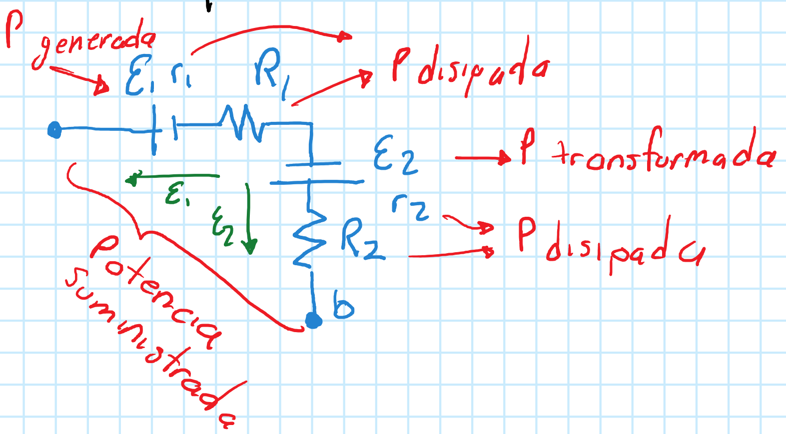
lunes, 20 de mayo de 2019 07:45 a. m.

1] Circuitos C.D.



- $i = \dfrac{\sum \varepsilon}{\sum r} = \dfrac{80}{46} \cong 1.73\,[A]$
- $\varepsilon_1\ ,\ \varepsilon_3 \stackrel{\Delta}{=}$ Generadores
- $\varepsilon_2\ ,\ \varepsilon_4 \stackrel{\Delta}{=}$ Motores

$$V = \frac{EnP}{q}\ ;\quad EnP = Vq\ ;\quad \Delta EnP = q(\Delta V)$$



$P_{entrada} = P_{salida}$

$P_{entrada} = P_{gen} + P_{sumin}$

$$\varepsilon = \frac{dEu}{dq}\ \text{No ele} \rightleftarrows \text{elec}$$

$$P = \frac{dEu}{dt} = \frac{\varepsilon\, dq}{dt}\ ;\quad P = \varepsilon i$$

$$\frac{dEuP}{dt} = V_{ab}\frac{dq}{dt}\ ;$$

$$\therefore P = V i$$

$\rightarrow P_{entrada} = \varepsilon_g i + \cancel{\underline{V_{ba}\, i}}$

$\rightarrow P_{salida} = P_{trans} + P_{disipada}$

$= \varepsilon_m i + \cancel{\underline{\sum i^2 R}}$

$$\varepsilon_g \cancel{i} + V_{ab}\cancel{i} = \varepsilon_m \cancel{i} + \sum i^{\cancel{2}} R\ ;$$

$\mathcal{E}_g + V_{ab} - \mathcal{E}_m + \Sigma i R$;

$$V_{ba} = -\mathcal{E}_g + \mathcal{E}_m + \Sigma i R$$

$$= \Sigma i g - (\mathcal{E}_g - \mathcal{E}_m)$$

// $\sum_{alg} \mathcal{E} = \mathcal{E}_g - \mathcal{E}_m$

$$\therefore V_{ba} = \Sigma i R - \Sigma \mathcal{E}$$

// Ejercicio → Parte 1

$$V_{ba} = (21)(1.73) - (40 + 100)$$

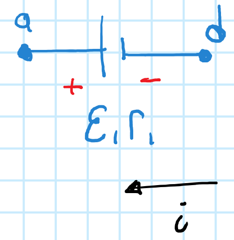
$$= -23.67\ [V]$$

$\therefore V_{ab} = 23.67\ [V]$ //

// Parte 2

$$V_{ab} = (25)(1.73) - (30 + (-10))$$

$$= 23.25\ [V]$$ //



// Fuente o Generador

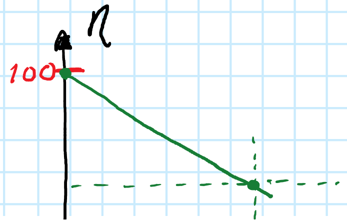
$$V_{da} = i\, r_{g_1} - (\mathcal{E}_{g_1}) =$$

$$= (4)(1.73) - 100 = -93.08\ [V]$$

$\rightarrow V_{ad} = 93.08$

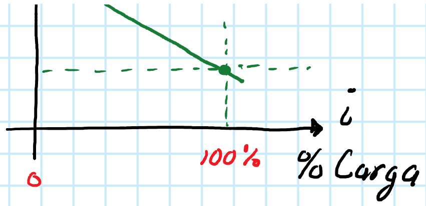
// $\eta_g = \dfrac{P_{salida}}{P_{entrada}} = \dfrac{\mathcal{E}_g i - i^2 r_g}{\mathcal{E}_g\, i} = \dfrac{\mathcal{E}_g - i r}{\mathcal{E}_g}$

$$\therefore \eta_g = \frac{V_{ad}}{\mathcal{E}_g} = \frac{\mathcal{E}_g - i r}{\mathcal{E}_g}$$



• if $i = 0$; $\mathcal{E}_g = V_{ad}$

NOTA: Comportamiento de la eficiencia



NOTA: Comportamiento de la eficiencia

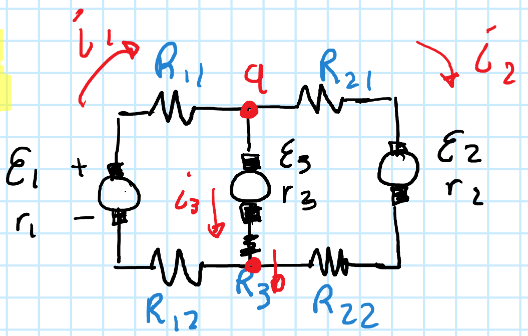
$$\eta_{motor} = \frac{P_{salida}}{P_{entrada}}$$

$$P_{entrada} = \varepsilon_m i + i^2 r$$

$$P_{salida} = \varepsilon_m i$$

$$\therefore \eta_{motor} = \frac{\varepsilon_m}{\varepsilon_m + i r}$$

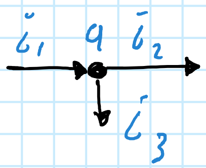
2]



NOTA

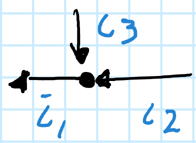
$$Num_{ecuaciones} = Num_{nodos} - 1$$

Nodo (a):



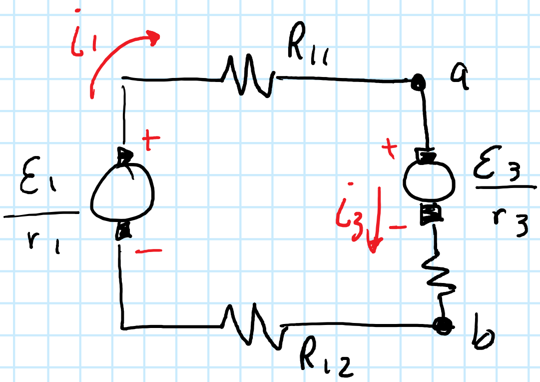
$$i_1 - i_2 - i_3 = 0$$

Nodo (b):



$$-i_1 + i_2 + i_3 = 0$$

// Ecuaciones de Mallas



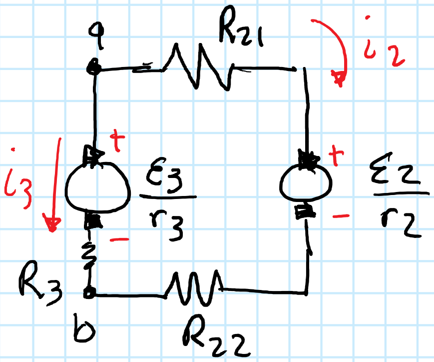
// 2° Ley Kirchoff

$$V_{ab} = \Sigma r i - \Sigma \varepsilon$$

$$V_{aa} = V_a - V_a = 0$$

$$\Sigma r i = \Sigma \varepsilon$$

$$(R_{11}+R_{12}+r_1)\,\underline{i_1} + 0\,\underline{i_2} + (R_3+r_3)\,\underline{i_3} = \mathcal{E}_1 - \mathcal{E}_3$$



$$0\,i_1 + (R_{21}+R_{22}+r_2)\,\underline{i_2} - (R_3+r_3)\,i_3 =$$
$$= -\mathcal{E}_2 + \mathcal{E}_3$$

//Malla externa

$$(R_{11}+R_{12}+r_1)\,i_1 + (R_{21}+R_{22}+r_2)\,i_2 + 0\,i_3 =$$
$$= \mathcal{E}_1 - \mathcal{E}_2$$

$$i_1 - i_2 - i_3 = 0$$

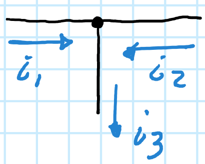
$$\Sigma R_1\,i_1 + 0\,i_2 + \Sigma R_3\,i_3 = \Sigma \mathcal{E}_I$$
$$0\,i_1 + \Sigma R_2\,i_2 - \Sigma R_3\,i_3 = \Sigma \mathcal{E}_{II}$$

$$\begin{bmatrix} 1 & -1 & -1 \\ R_1 & 0 & R_3 \\ 0 & R_2 & -R_3 \end{bmatrix}\begin{bmatrix} i_1 \\ i_2 \\ i_3 \end{bmatrix} = \begin{bmatrix} 0 \\ \mathcal{E}_I \\ \mathcal{E}_{II} \end{bmatrix} \quad ; (R)(i) = \mathcal{E}$$

//Valores

$\mathcal{E}_1 = 50\,[V]$	$r_1 = 3\,[\Omega]$	$R_{11} = 4\,[\Omega]$	$R_{22} = 7\,[\Omega]$
$\mathcal{E}_2 = 20\,[V]$	$r_2 = 1\,[\Omega]$	$R_{12} = 5\,[\Omega]$	$R_3 = 8\,[\Omega]$
$\mathcal{E}_3 = 30\,[V]$	$r_3 = 2\,[\Omega]$	$R_{21} = 6\,[\Omega]$	

// Obteniendo corriente 3



$$i_1 + i_2 - i_3 = 0$$

$$i_3 = i_1 + i_3 =$$

28_Clase

miércoles, 22 de mayo de 2019 07:19 a. m.

→ Campos Magnéticos

- Es aquel estado modificado del espacio en la vecindad de un iman

- Campo Magnético $\triangleq \bar{B}$ $\left[\frac{Weber}{m^2}\right]$

- Densidad de Campo Magnético o vector inducción magnético
  - Lineas de Campo $N \to S$

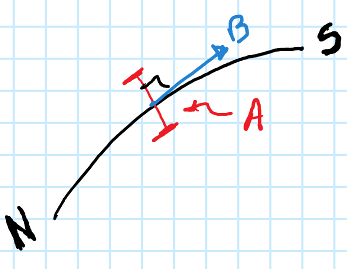
NOTA ① Los polos magnéticos no se pueden separar

② El campo magnético se puede representarse graficamente con lineas conocidas como lineas de inducción

Además, el campo magnético es directamente proporcional a la cantidad de lineas de inducción

Las lineas de inducción deben dar la dirección del campo magnético.

Casos

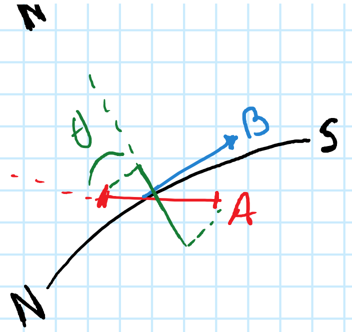


$N \sim B$

$N \sim A$

$\therefore N = \cancel{K}^{1} B A$

$A \triangleq$ Perpendicular



$N \sim B$
$N \sim A_{proyectada}$
$\therefore N = BA\cos\theta$

$A \neq$ Perperdicular

- if $B \neq$ cte en la superficie

$\Delta A, \quad \Delta N = B \cdot \Delta A$ | $\lim \Delta A \to 0$

$N = \Sigma\, \Delta N$ | $\therefore dN = B \cdot dA$

$\int dN = \int B \cdot dA \qquad \phi = \int B \cdot dA \triangleq$ Lineas de Inducción o flujo magnético

$$\therefore \underline{N = \phi}$$

$\phi = \int B \cdot dA \; ; \; \int_{S.cerrada} B \cdot dA = 0$

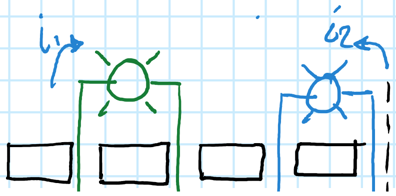
$\to \int E \cdot dA = \int (\nabla \cdot E)\, dA$

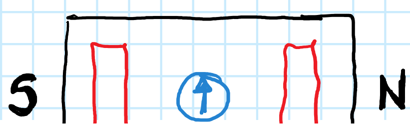
$\to \int_{S.C} B \cdot dA = \int (\nabla \cdot B)\, d\tau = 0 \; ; \; \underline{\nabla \cdot B = 0}$

$\phi = \int B \cdot dA$

$d\phi = B \cdot dA_{pro} \; ; \; \underline{B = -\frac{d\phi}{dA_{pro}}}$

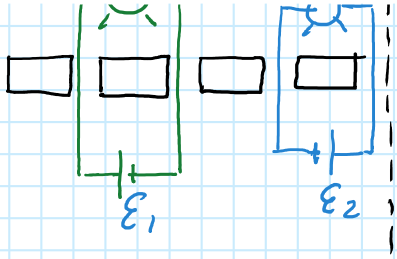
Ley de Lenz



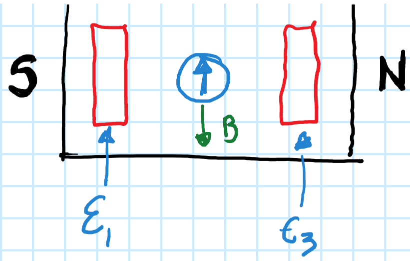


Experimento de Oersted

de Oersted



//Vista lateral



Regla de la Mano Derecha

- $B = f(i) = f(q, v)$
- $F_{mag} = f(i, B) = f(i_1, i_2)$

① El campo magnético lo produce la carga eléctrica en movimiento o bien una corriente eléctrica y a su vez los campos magnéticos producen fuerzas magnéticas.

- Las fuerzas magnéticas se tienen sobre carga en movimiento.